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JAMES A. DELAND
DELAND LAW OFFICE
P.O Box 69
Klamath River, CA 96050-0069

EXAMINER	
JOHNSON, VICKY A	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/001,324
Filing Date: November 23, 2001
Appellant(s): ICHIDA, TADASHI

James A. Deland
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed December 27, 2005 appealing from the Office action mailed June 14, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

No evidence is relied upon by the examiner in the rejection of the claims under appeal.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-7, 13, 18, 20-28 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ethington (US 5,681,234) in view of Browning (US 5,261,858).

Ethington discloses an apparatus for controlling a first bicycle transmission and a second bicycle transmission which, in combination, sets a speed stage of the bicycle, comprising: a transmission position communication path for communicating information indicating the operational position of the first transmission and the second transmission (col. 9 lines 1-25); a transmission command communication path for communicating information for controlling the operation of the first transmission and the second transmission (col. 8 lines 1-12); a shift command communication path for communicating electronic shift commands to select a speed stage of the bicycle (col. 11 lines 31-37); a transmission control unit (72) operatively coupled to the shift command communication path, to the transmission position communication path and to the transmission command communication path for receiving the shift commands and the information indicating the operational position of the first transmission and the second transmission and for generating the information for controlling the operation of the first transmission and the second transmission (col. 9 line 1 – col. 10 line 66), and wherein for at least one shift command requesting a shift from an origin speed stage to a destination speed stage that requires the operation of both the first transmission and the second transmission, the first

transmission and the second transmission are set temporarily in a speed stage outside of a range between the origin speed stage and the destination speed stage (see Table II, to go from speed range 5 at a ratio of 2.16 to a speed range 8 at a ratio of 2.86, the rear transmission must first engage speed range 4 at a ratio of 2.00, which is outside of the range 2.16 to 2.86; also see col. 13 lines 18-22).

Ethington does not disclose that the transmission control unit receives at least one shift command requesting a shift through N speed stages to a destination speed stage, where N is an integer greater than one, the transmission control unit generates information for causing the first transmission and the second transmission in combination to move a total of M times to reach the destination speed stage, where M is an integer less than N.

Browning discloses a shift through N speed stages to a requested destination speed stage in a range where all speed stages are available (see Table 10), where N is an integer greater than one, for causing the first transmission and the second transmission in combination to move a total of M times to move to a different destination speed stage (col. 22 lines 4-11, a shift from 6 to 4 would be N=2 and M=1, the requested shift is 4, but since the shift from 6 to 4 is illegal the shift is made from 6 to 3, which according to table 10 requires the second transmission to only shift down so that M equals 1) that has a gear ratio in close proximity to a gear ratio of the requested destination speed (see Table 1 to determine gear ratio), where M is an integer less than N (see Tables 1 and 10, and col. 4 line 47 – col. 5 line 68).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Ethington to include a shift through N speed stages to a destination speed, for causing the first and second transmission to move a total of M times to reach the destination speed as taught by Browning in order to provide the fastest possible shift between any two gears (col. 4 line 47 – col. 5 line 68).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to disregard the operation of both the first transmission and the second transmission being set temporarily in a speed stage outside of a range between the origin speed stage and the destination speed stage when moving from the origin speed stage to the requested destination speed stage, since it has been held that the omission of a step or an element and its function is obvious if the function is not desired. See MPEP 2144.04; and *In re Larson,* 340 F.2d 965, 144 USPQ 347 (CCPA 1965) and *In re Kuhle,* 526 F.2d 553, 188 USPQ 7 (CCPA 1975).

Re claims 2 and 23, Ethington shows the information for controlling the operation of the first transmission and the second transmission comprises a first signal for operating a front derailleur and a second signal for operating a rear derailleur (col. 10 lines 15-19).

Re claim 3 and 24, Ethington shows the transmission control unit comprises a table memory for storing a table containing the information for controlling the operation of the first transmission and the second transmission (col. 9 lines 37-49).

Re claims 4 and 25, Browning shows the first transmission moves to X first transmission positions, wherein the second transmission moves to Y second transmission positions, wherein X any Y both are integers greater than 1 (see Tables 1 and 10), and Ethington shows the table memory contains information for controlling the operation of at least one of the first transmission and the second transmission for each X first transmission position and for each Y second transmission position (col. 9 lines 37-49).

Re claims 5 and 26, Ethington shows the table memory contains information for moving only one of the first transmission and the second transmission by only one of the corresponding first transmission positions and second transmission positions to reach the destination speed stage in response to a shift command requesting a shift through N speed stages to reach the destination speed stage (col. 24 line 48 – col.25 line 44).

Re claims 6 and 27, Ethington shows the table memory contains information for controlling the operation of at least one of the first transmission and the second transmission for shift commands requesting a shift through a single speed stage and for shift commands requesting a shift through N speed stages (col. 24 line 48 – col.25 line 44).

Re claims 7 and 28, Ethington shows the table memory contains information for maintaining both the first transmission and the second transmission stationary in response to a shift command requesting a shift through N speed stages to reach the destination speed stage (col. 24 line 48 – col.25 line 44).

Re claims 13 and 34, Ethington shows a manually operated shift control unit operatively coupled to the shift command communication path (col. 7 lines 13-49).

Re claim 18 Ethington shows a manually-operated shift control unit operatively coupled to the shift command communication path (col. 7 lines 13-49); a speed sensor (82) operatively coupled to a speed communication path (col. 8 lines 13-22); and an automatic shift control unit operatively coupled to the speed communication path and to the shift command communication path for automatically generating shift commands based on information received from the speed sensor (col. 7 line 50 – col. 8 line 32).

Re claim 20, Ethington shows a plurality of front sprockets (24); a front derailleur (36) for moving a chain among the plurality of front sprockets; a front derailleur motor (48) for moving the front derailleur; a plurality of rear sprockets (34); a rear derailleur (38) for moving the chain among the plurality of rear sprockets; a rear derailleur motor (54) for moving the rear derailleur; a front derailleur position sensor (134) for providing a signal indicating a front sprocket position of the front derailleur; a rear derailleur position sensor (134') for providing a signal indicating a rear sprocket position of the rear derailleur; wherein the front sprocket position of the front derailleur and the rear sprocket position of the rear derailleur set a speed stage of the bicycle transmission (col. 10 line 33 – col. 11 line 29); a transmission position communication path operatively coupled to the front derailleur position sensor and to the rear derailleur position sensor for communicating the signals indicating the front

sprocket position and the rear sprocket position (col. 10 line 33 – col. 11 line 29); a transmission command communication path operatively coupled to the front derailleur motor and to the rear derailleur motor for communicating information for controlling the operation of the front derailleur motor and the rear derailleur motor (col. 8 lines 1-12); a shift command communication path for receiving shift commands to set a desired speed stage (col. 11 lines 31-37); a transmission control unit (72) operatively coupled to the shift command communication path, to the transmission position communication path and to the transmission command communication path for receiving the shift commands and the signals indicating the front sprocket position and the rear sprocket position and for generating the information for controlling the operation of the front derailleur motor and the rear derailleur motor (col. 9 line 1 – col. 10 line 66); and Browning shows and renders obvious the transmission control unit receives at least one shift command requesting a shift through N speed stages to a destination speed stage, where N is an integer greater than one, the transmission control unit generates information for causing the front derailleur and the rear derailleur in combination to move a total of M sprocket positions to reach the destination speed stage that has a gear ratio in close proximity to a gear ratio of the requested destination speed (see Table 1 to determine gear ratio), where M is an integer less than N (see Tables 1 and 10, and col. 4 line 47 – col. 5 line 68).

Re claim 21, Ethington shows a change of gear ratio when the front derailleur moves from a first front sprocket to a second front sprocket is approximately equal to twice a change of gear ratio when the rear derailleur

moves from a first rear sprocket to a second rear sprocket (see Table III; from A-1 to B-1 = .43; from A-1 to A-2 = .24).

Re claim 22, Ethington shows a method for controlling a first bicycle transmission and a second bicycle transmission which, in combination, sets a speed stage of the bicycle, comprising the steps of: receiving, by a transmission control unit, information indicating the operational position of the first transmission and the second transmission (col. 10 line 33 – col. 11 line 29); and generating, by the transmission control unit, information for causing the first transmission and the second transmission in combination to move (col. 9 line 1 – col. 10 line 66) a total of M times to reach the destination speed stage; and Browning shows and renders obvious receiving, by the transmission control unit, at least one shift command requesting a shift through N speed stages to a destination speed stage, wherein N is an integer greater than one (see Tables 1 and 10, and col. 4 line 47 – col. 5 line 68).

1. Claims 14-16 and 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ethington (US 5,681,234) in view of Browning (US 5,261,858) as applied to claims 1-7, 13, 18, 20-28 and 34 and further in view of Colbert et al (US 5,213,548).

Ethington shows a control unit as described above, but does not disclose a speed sensor operatively coupled to a speed communication path.

Colbert et al show a speed sensor (56) operatively coupled to a speed communication path (col. 6 lines 14-28); and an automatic shift control unit operatively coupled to the speed communication path and to the shift command

communication path for automatically generating shift commands based on information received from the speed sensor (col. 2 lines 24-29).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the control unit of Ethington to include a speed sensor as taught by Colbert et al in order to improve efficiency (col. 3 lines 24-28).

Re claim 15, Colbert et al show the automatic shift control unit generates shift commands based on bicycle speed (col. 3 lines 1-6).

Re claim 16, Colbert et al show the automatic shift control unit generates shift commands based on bicycle acceleration (col. 8 line 60 – col. 9 line 8).

Re claim 35, Colbert et al show receiving, by an automatic shift command unit, information from a speed sensor (56); and automatically generating shift commands based on information received from the speed sensor (col. 2 lines 24-29).

Re claim 36, Colbert et al show the automatic shift control unit generates shift commands based on bicycle speed (col. 3 lines 1-6).

Re claim 37, Colbert et al show the automatic shift control unit generates shift commands based on bicycle acceleration (col. 8 line 60 – col. 9 line 8).

Claims 17, 19 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ethington (US 5,681,234) in view of Browning (US 5,261,858) as applied to claims 1-7, 13, 18, 20-28 and 34 above, and further in view of Spencer et al (US 6,047,230).

Ethington discloses the control unit as described above, but does not disclose a cadence sensor operatively coupled to a cadence communication path; and an automatic shift control unit operatively coupled to the cadence communication path and to the shift command communication path for automatically generating shift commands based on information received from the cadence sensor.

Spencer et al shows a cadence sensor (24) operatively coupled to a cadence communication path (col. 6 lines 6-12); and an automatic shift control unit (21) operatively coupled to the cadence communication path and to the shift command communication path for automatically generating shift commands based on information received from the cadence sensor (col. 6 line 66 – col. 7 line 8).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the automatic control unit of Ethington to include a cadence sensor as taught by Spencer et al in order to increase efficiency and safety (col. 2 lines 1-7).

Re claim 19, Ethington shows a manually-operated shift control unit operatively coupled to the shift command communication path (col. 7 lines 13-49); and Spencer et al show and render obvious a cadence sensor (24) operatively coupled to a cadence communication path (col. 6 lines 6-12); and an automatic shift control unit operatively coupled to the cadence communication path and to the shift command communication path for automatically generating

shift commands based on information received from the cadence sensor (col. 6 line 66 – col. 7 line 8).

(10) Response to Argument

Ethington discloses an automatic bicycle transmission having sprocket combinations having successively increasing gear ratios, an electronic controller which operates a front and rear bicycle derailleurs to upshift and downshift from the highest to the lowest gear ratio.

Ethington does not disclose a transmission control unit that receives at least one shift command requesting a shift through N speed stages to a destination speed stage, where N is an integer greater than one, such that the transmission control unit generates information causing the first transmission and the second transmission in combination to move a total of M times to reach the destination speed stage, where M is an integer less than N.

Browning discloses an automatic bicycle transmission wherein front and rear derailleurs are operated to produce a desired gear ratio. Browning also operates to avoid "illegal gears." An illegal shift is a shift from a first gear to a second gear such that the bicycle must transition through a third gear that is not between the first and second gears.

A gear that avoids shifting from an original gear to an intermediate gear and then to the destination gear is termed a legal gear.

The applicant argues that eliminating the step of shifting through illegal gears would not be obvious to one having ordinary skill in the art, but the Browning reference teaches shifting without moving through an illegal gear. In

Table 5 of the Browning reference to shift from 2nd gear to 5th gear N= 2 and M=1, and there is no shifting through illegal gears.

Claims 1, 20, and 22 states that "without regard to whether or not" which is basically saying that it does not matter if it does or does not shift through illegal gears to reach the destination gear.

It would have been obvious to disregard the operation of both the first transmission and the second transmission being set temporarily in a speed stage outside of a range between the origin speed stage and the destination speed stage when moving from the origin speed stage to the requested destination speed stage, since it has been held that the omission of a step or an element and its function is obvious if the function is not desired. See MPEP 2144.04; and *In re Larson,* 340 F.2d 965, 144 USPQ 347 (CCPA 1965) and *In re Kuhle,* 526 F.2d 553, 188 USPQ 7 (CCPA 1975).

The MPEP states that it would be obvious to eliminate the step if the step is not desired or required. The elimination of the step of the first and second transmissions being set temporarily in a speed stage outside of a range between the origin and destination speed stages may not be desired in all environments.

Claims 14-16 and 35-37 add a speed sensor and an automatic shift control unit that generates shift commands based on information received from the speed sensor. Colbert et al disclose an automatic transmission for a bicycle that shifts gears according to wheel speed in order to improve efficiency. The applicant argues that the motivation to combine the teachings of Colbert et al with Ethington and Browning is not applicable because the applicant interprets

that the recited passage (col. 3 lines 24-28) might pertain to a manual mode of operation. In column 3 lines 24-28 it does not state anything regarding the manual mode of operation.

The applicant also argues that to combine the Simpson reference with the teachings of Ethington and Browning is also not applicable, because the motivation to combine the cadence sensor of Spencer, in order to increase efficiency and safety," does not single out crank rotation.

It is believed that the entire disclosure of the above noted references provide teachings that improve efficiency and/or safety.

For the above reasons, it is believed that the rejections should be sustained.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

VAJ
March 17, 2006

Conferees
Vicky A. Johnson
Thomas Hannon
Richard Ridley